

ENVIROCON, INC.

101 INTERNATIONAL WAY
POST OFFICE BOX 8543
MISSOULA, MONTANA 59807
TELEPHONE: (406) 523-1150
FAX: (406) 721-4794

February 13, 1991

ENVIROCON, INC.

Solid and Hazardous Waste Bureau
Department of Health and
Environmental Sciences
Cogswell Building
Helena, Montana 59620

Attention: Mr. John Wadham

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Subject: December 1990 Ground Water Sampling Results - Livingston Rail Yard

Dear John:

Burlington Northern Railroad Co., through its contractor Envirocon, Inc., collected seven samples during the December 1990 monthly sampling round. Five of the samples were from Wells LG-10, LB-6 (two samples), 89-2, and the B Street Well, and two samples were trip blanks. Enclosed are complete sample analytical results.

If you have any questions or comments about this data, please contact me at your convenience.

Sincerely,

ENVIROCON, INC.

John Mills
John Mills

Hydrogeologist

Kris Kok
Kris Kok
Project Manager

Enclosures
cc: Mel Burda
Dennis Iverson
Steve Pilcher
Mike Stevenson
Missoula file

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FAX (406) 252-6069 • 1-800-873-5227

ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

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ENVIROCON, Inc.
Billington, MT

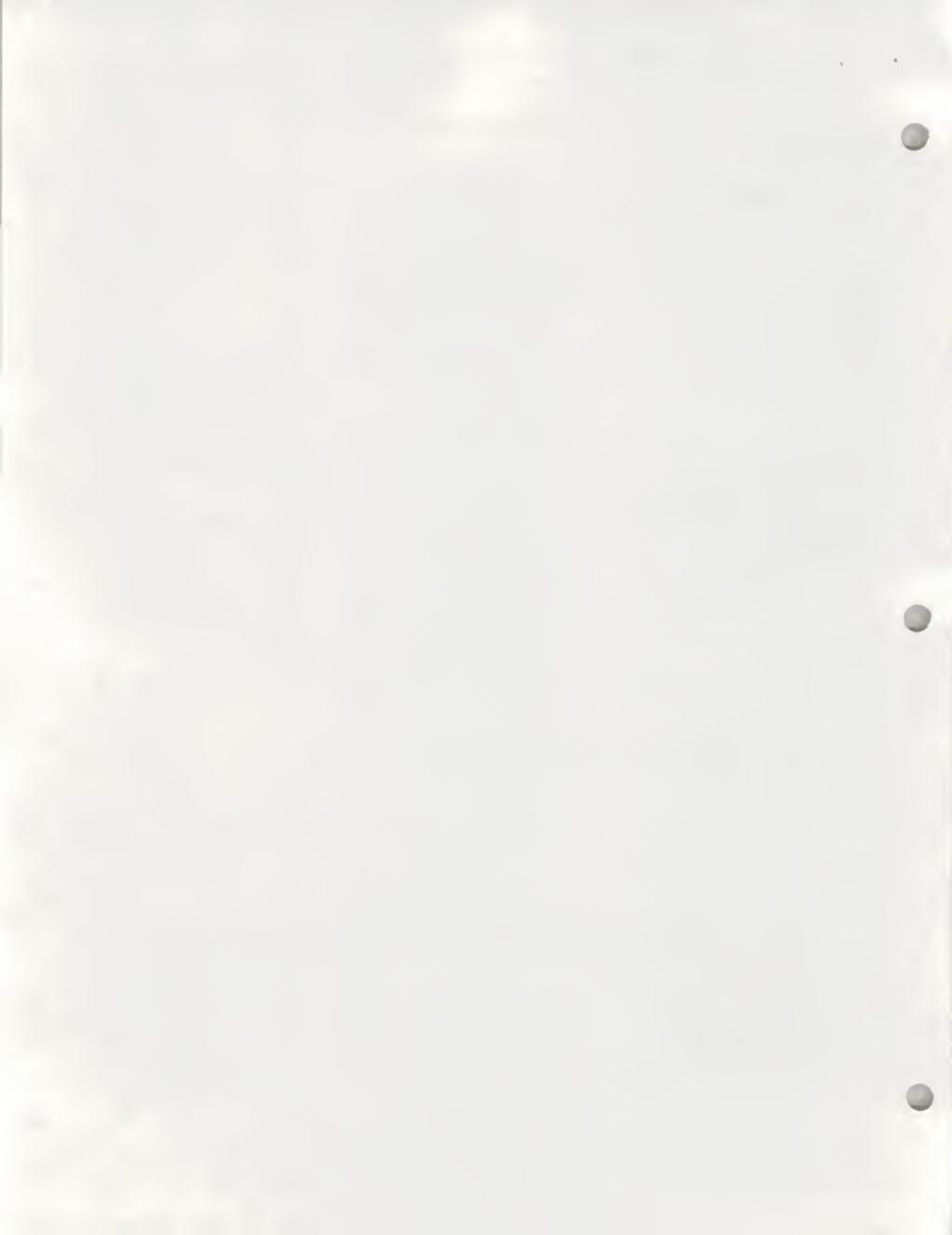
Water Analysis

PROJECT: Livingston / BN

LAB NO.	91-1697
SAMPLE IDENTIFICATION	140101-630
SAMPLE SUBMITTED	01/04/91
DATE REPORTED	01/14/91
SAMPLE DATE	01/03/91
SAMPLE TIME	1310

CONSTITUENT	ug/l
-------------	------

Benzene	<0.50
Bromobenzene	<1.0
Bromochloromethane	<1.0
Bromodichloromethane	<1.0
Bromoform	<1.0
Bromomethane	<1.0
n-Butylbenzene	<1.0
sec-Butylbenzene	<1.0
tert-Butylbenzene	<1.0
Carbon tetrachloride	<0.50
Chlorobenzene	<1.0
Chloroethane	<1.0
Chloroform	<1.0
Chloromethane	<1.0
2-Chlorotoluene	<1.0
4-Chlorotoluene	<1.0
1,2-Dibromo-3-chloropropane	<1.0
Dibromochloromethane	<1.0
1,2-Dibromoethane	<1.0
1,2-Dichlorobenzene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
Dichlorodifluoromethane	<1.0
1,1-Dichloroethane	<1.0
1,2-Dichloroethane	<0.50
1,1-Dichloroethene	<0.50
cis-1,2-Dichloroethene	<1.0
trans-1,2-Dichloroethene	<1.0
1,2-Dichloropropane	<1.0
1,3-Dichloropropane	<1.0
2,2-Dichloropropane	<1.0
1,1-Dichloropropene	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0



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ENVIROCON, Inc.
Livingston, MT

Water Analysis

PROJECT: Livingston / BN

PAGE 2

LAB NO.	91-1697
SAMPLE IDENTIFICATION	140101-630
SAMPLE SUBMITTED	01/04/91
DATE REPORTED	01/14/91
SAMPLE DATE	01/03/91
SAMPLE TIME	1310

CONSTITUENT	ug/l
-------------	------

Ethylbenzene	<1.0
Hexachlorobutadiene	<1.0
Isopropylbenzene	<1.0
p-Isopropyltoluene	<1.0
Methylene chloride	<1.0
Naphthalene	<1.0
n-Propylbenzene	<1.0
Styrene	<1.0
1,1,1,2-Tetrachloroethane	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Tetrachloroethene	<0.50
Toluene	<1.0
1,2,3-Trichlorobenzene	<1.0
1,2,4-Trichlorobenzene	<1.0
1,1,1-Trichloroethane	<0.50
1,1,2-Trichloroethane	<1.0
Trichloroethene	<0.50
Trichlorofluoromethane	<1.0
1,2,3-Trichloropropane	<1.0
1,2,4-Trimethylbenzene	<1.0
1,3,5-Trimethylbenzene	<1.0
Vinyl chloride	<0.50
Xylenes	<1.0

REMARKS: Sample was properly preserved and in specified container.
Sample was analyzed in accordance with EPA Method 524.2.

Q.A. Review: for Scholz





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LIVINGSTON MT 59047

1-3-1991

ENVIROCON, Inc.
Livingston, MT

Water Analysis

PROJECT: Livingston / BN

LAB NO.

ANALYST

VERIFIED

SAMPLE IDENTIFICATION

91-1695
140101-62891-1696
140101-629

SAMPLE SUBMITTED

01/04/91

01/04/91

DATE REPORTED

01/14/91

01/14/91

SAMPLE DATE

01/03/91

01/03/91

SAMPLE TIME

1045

1233

CONSTITUENT

ug/l

ug/l

Purgeable Halocarbons
EPA Method 8260

Bromodichloromethane	<1.0	<1.0
Bromoform	<1.0	<1.0
Bromomethane	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0
Chlorobenzene	<1.0	<1.0
Chloroethane	<1.0	<1.0
2-Chloroethylvinyl ether	<1.0	<1.0
2-Chlorotoluene	<1.0	<1.0
Chloroform	<1.0	<1.0
Chloromethane	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0
cis-1,2-Dichloroethene	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0



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LIVINGSTON MT 59047

Water Analysis

PROJECT: Livingston / BN

PAGE 2

LAB NO.	91-1695	91-1696
SAMPLE IDENTIFICATION	140101-628	140101-629
SAMPLE SUBMITTED	01/04/91	01/04/91
DATE REPORTED	01/14/91	01/14/91
SAMPLE DATE	01/03/91	01/03/91
SAMPLE TIME	1045	1233

CONSTITUENT	ug/l	ug/l
-------------	------	------

Purgeable Halocarbons
EPA Method 8260

1,2-Dichloropropane	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0
Methylene chloride	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0
1,1,1-Trichloroethane	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0
Trichloroethene	<1.0	<1.0
Trichlorofluoromethane	<1.0	<1.0
Vinyl chloride	<1.0	<1.0
Dichlorodifluoromethane	<1.0	<1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.

Q.A. Review: for Shulin



ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

Water Analysis

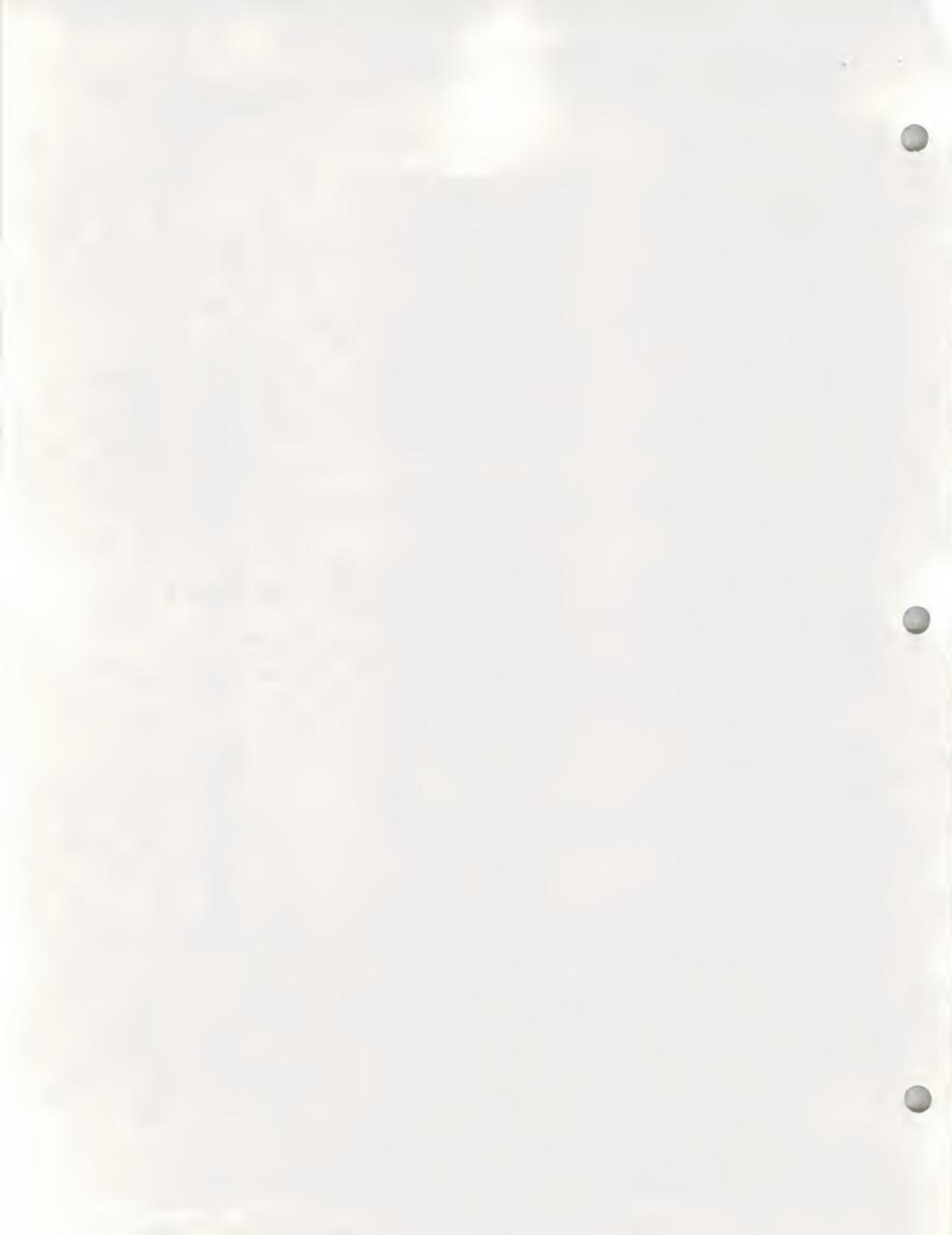
PROJECT: Livingston / BN

LAB NO.	90-35074	90-35075
SAMPLE IDENTIFICATION	140101-625	140101-627
SAMPLE SUBMITTED	12/31/90	12/31/90
DATE REPORTED	01/24/91	01/24/91
SAMPLE DATE	12/28/90	12/28/90
SAMPLE TIME	1345	1603

CONSTITUENT	ug/l	ug/l
-------------	------	------

Purgeable Halocarbons
EPA Method 524.2

Bromodichloromethane	<1.0	<1.0
Bromoform	<1.0	<1.0
Bromomethane	<1.0	<1.0
Carbon tetrachloride	<0.50	<0.50
Chlorobenzene	<1.0	<1.0
Chloroethane	<1.0	<1.0
2-Chloroethylvinyl ether	<1.0	<1.0
2-Chlorotoluene	<1.0	<1.0
Chloroform	<1.0	<1.0
Chloromethane	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0
1,4-Dichlorobenzene	<0.50	<0.50
1,1-Dichloroethane	<1.0	<1.0
1,2-Dichloroethane	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50
cis-1,2-Dichloroethene	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0



ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

Water Analysis

PROJECT: Livingston / BN

PAGE 2

LAB NO.	90-35074	90-35075
SAMPLE IDENTIFICATION	140101-625	140101-627
SAMPLE SUBMITTED	12/31/90	12/31/90
DATE REPORTED	01/24/91	01/24/91
SAMPLE DATE	12/28/90	12/28/90
SAMPLE TIME	1345	1603

CONSTITUENT	ug/l	ug/l
-------------	------	------

Purgeable Halocarbons
EPA Method 524.2

1,2-Dichloropropane	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0
Methylene chloride	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0
Tetrachloroethene	<0.50	<0.50
1,1,1-Trichloroethane	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0
Trichloroethene	<0.50	<0.50
Trichlorofluoromethane	<1.0	<1.0
Vinyl chloride	<0.50	<0.50
Dichlorodifluoromethane	<1.0	<1.0

NOTE: This analysis is equivalent to EPA Method 601.

Q.A. Review: for Shuler





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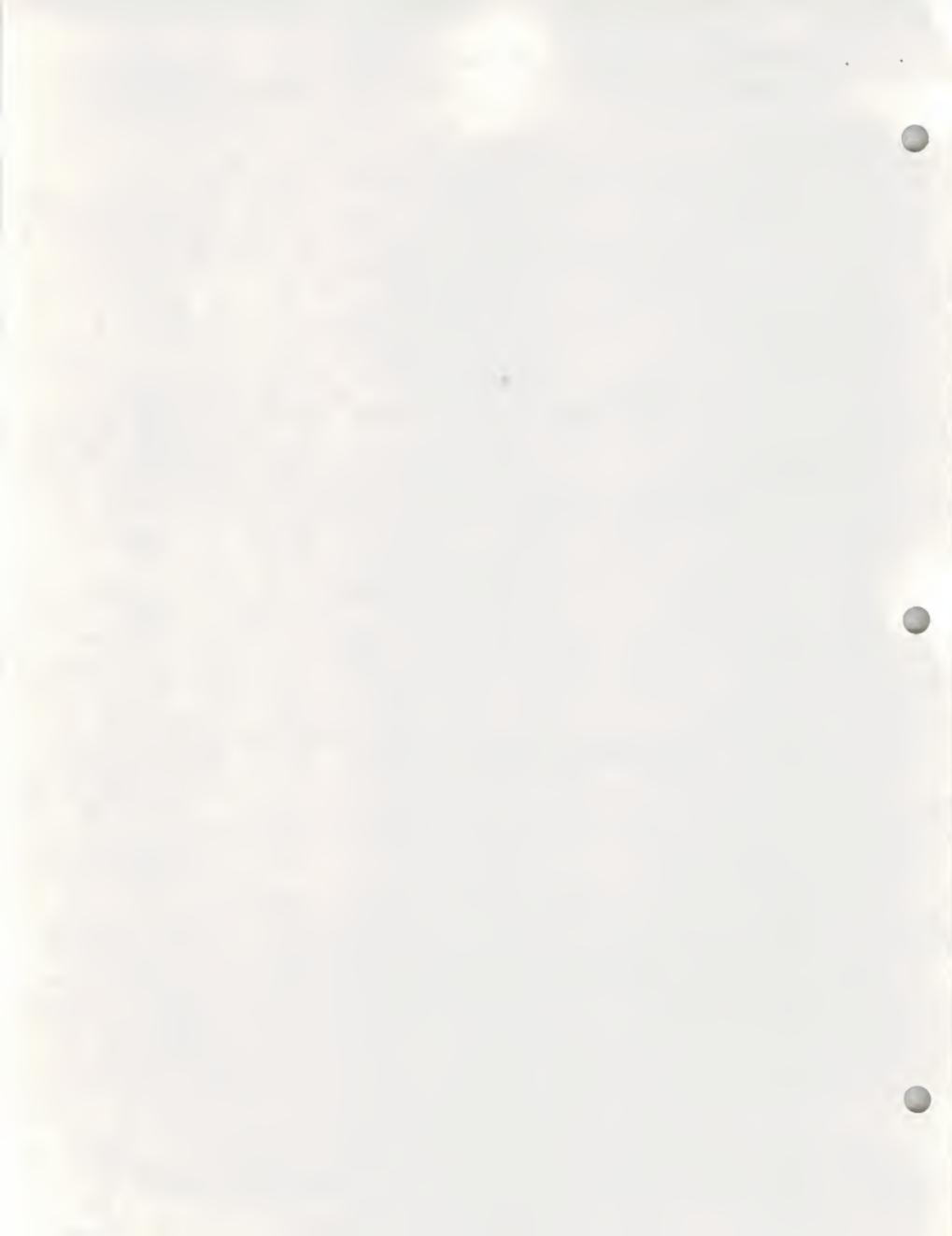
Water Analysis

PROJECT: Livingston/BN

LB-6

LAB NO.	90-35073
SAMPLE IDENTIFICATION	140101-626
SAMPLE SUBMITTED	12/31/90
DATE REPORTED	01/02/91
SAMPLE DATE	12/28/90
SAMPLE TIME	1450

Volatile Organic Constituent	ug/l
Benzene	<0.50
Bromobenzene	<1.0
Bromochloromethane	<1.0
Bromodichloromethane	<1.0
Bromoform	<1.0
Bromomethane	<1.0
n-Butylbenzene	<1.0
sec-Butylbenzene	<1.0
tert-Butylbenzene	<1.0
Carbon tetrachloride	<0.50
Chlorobenzene	<1.0
Chloroethane	<1.0
Chloroform	<1.0
Chloromethane	<1.0
2-Chlorotoluene	<1.0
4-Chlorotoluene	<1.0
1,2-Dibromo-3-chloropropane	<1.0
Dibromochloromethane	<1.0
1,2-Dibromoethane	<1.0
Dibromomethane	<1.0
1,2-Dichlorobenzene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
Dichlorodifluoromethane	<1.0
1,1-Dichloroethane	<1.0
1,2-Dichloroethane	<0.50
1,1-Dichloroethene	<0.50
cis-1,2-Dichloroethene	<1.0
trans-1,2-Dichloroethene	<1.0
1,2-Dichloropropane	<1.0



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LIVINGSTON MT 59047

Water Analysis

PROJECT: Livingston/BN

PAGE 2

LB-6

LAB NO.	90-35073
SAMPLE IDENTIFICATION	140101-626
SAMPLE SUBMITTED	12/31/90
DATE REPORTED	01/02/91
SAMPLE DATE	12/28/90
SAMPLE TIME	1450

Volatile Organic Constituent	ug/l
------------------------------	------

1,3-Dichloropropane	<1.0
2,2-Dichloropropane	<1.0
1,1-Dichloropropene	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0
Ethylbenzene	<1.0
Hexachlorobutadiene	<1.0
Isopropylbenzene	<1.0
p-Isopropyltoluene	<1.0
Methylene chloride	<1.0
Naphthalene	<1.0
n-Propylbenzene	<1.0
Styrene	<1.0
1,1,1,2-Tetrachloroethane	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Tetrachloroethene	0.62
Toluene	<1.0
1,2,3-Trichlorobenzene	<1.0
1,2,4-Trichlorobenzene	<1.0
1,1,1-Trichloroethane	<0.50
1,1,2-Trichloroethane	<1.0
Trichloroethene	<0.50
Trichlorofluoromethane	<1.0
1,2,3-Trichloropropane	<1.0
1,2,4-Trimethylbenzene	<1.0
1,3,5-Trimethylbenzene	<1.0
Vinyl chloride	<0.50
m-p-Xylenes	<1.0
o-Xylene	<1.0

REMARKS: Sample was properly preserved and in specified container.
Sample was analyzed in accordance with EPA Method 524.2.Q.A. Review: for Shadis



ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

Water Analysis

PROJECT: Livingston - EPD

LAB NO. 90-33981
SAMPLE IDENTIFICATION 140101-624
SAMPLE SUBMITTED 12/12/90
DATE REPORTED 12/20/90
SAMPLE DATE 12/04/90
SAMPLE TIME 1340

Total Petroleum Hydrocarbons <0.1 mg/l (ppm)

Q.A. Review: for Shuler

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12/20/90
Envirocon Inc.
Livingston, MT

LB-6
X

→ 13.90

13.90
is included in
Determination
as (R)

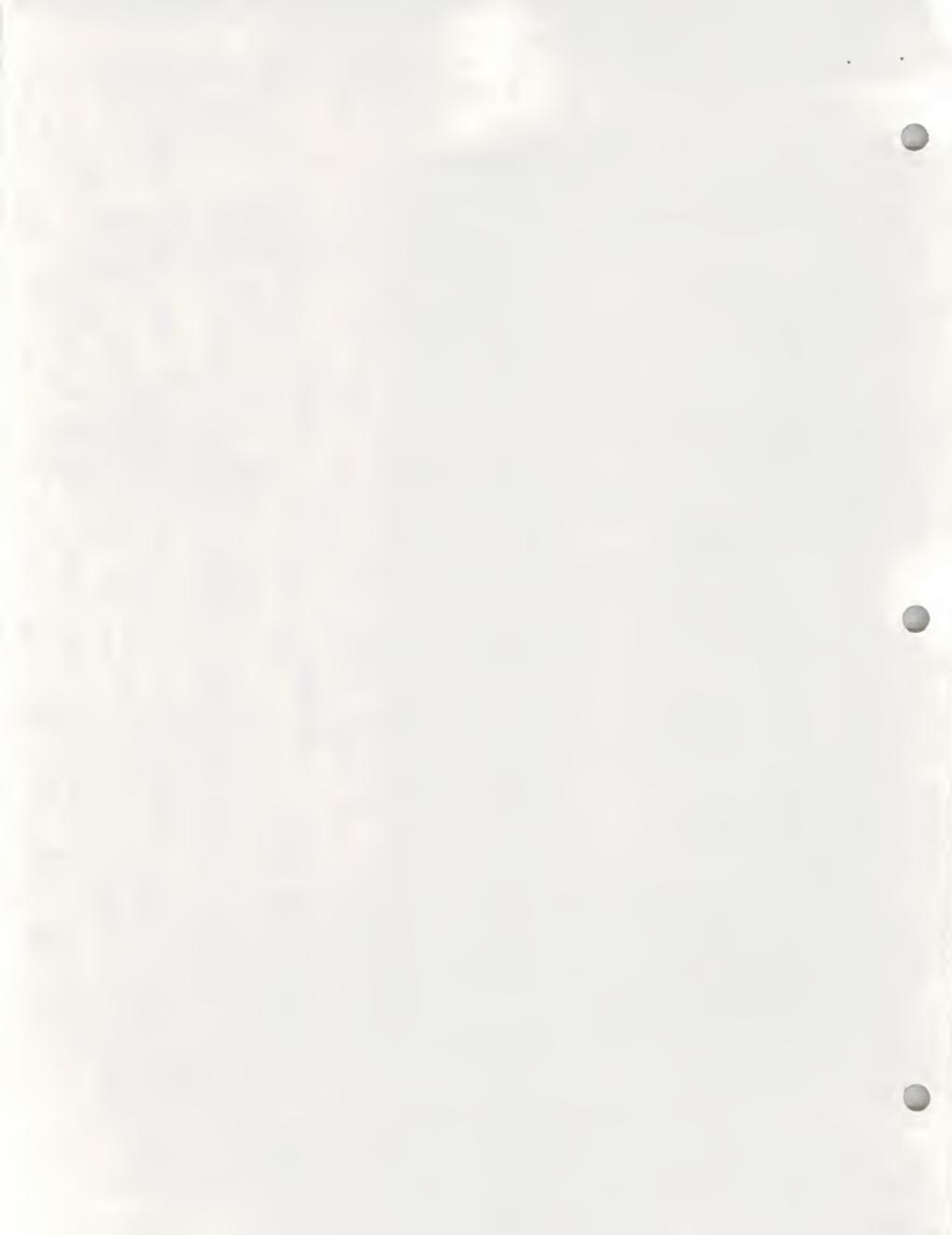


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PO BOX 1154
LIVINGSTON MT 59047RECEIVED
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ENVIROCON, Inc.
LIVINGSTON, MT

Water Analysis

PROJECT: ~~Kroome/O'Connor~~

LAB NO.	90-33979	90-33980	90-33981
SAMPLE IDENTIFICATION	140103-27	140103-28	140101-624
SAMPLE SUBMITTED	12/12/90	12/12/90	12/12/90
DATE REPORTED	12/20/90	12/20/90	12/20/90
SAMPLE DATE	12/04/90	12/04/90	12/04/90
SAMPLE TIME	1220	1255	1340
CONSTITUENT	ug/l	ug/l	ug/l
Dichlorodifluoromethane	<1.0	<1.0	<1.0
Chloromethane	<1.0	<1.0	<1.0
Vinyl chloride	<0.50	<0.50	<0.50
Bromomethane	<1.0	<1.0	<1.0
Chloroethane	<1.0	<1.0	<1.0
Trichlorofluoromethane	<1.0	<1.0	<1.0
1,1-Dichloroethene	<0.50	<0.50	<0.50
Methylene Chloride	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0	<1.0
2,2-Dichloropropane	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.0	<1.0
Bromochloromethane	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	<0.50	<0.50	<0.50
Carbon Tetrachloride	<0.50	<0.50	<0.50
1,1-Dichloropropene	<1.0	<1.0	<1.0
Benzene	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50
Trichloroethene	<0.50	<0.50	<0.50
1,2-Dichloropropane	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0
Dibromomethane	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0
Tetrachloroethene	7.9	<0.50	0.79
1,3-Dichloropropane	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	1.0	<1.0
1,2-Dibromoethane	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	<1.0	<1.0	<1.0



Page 2

ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

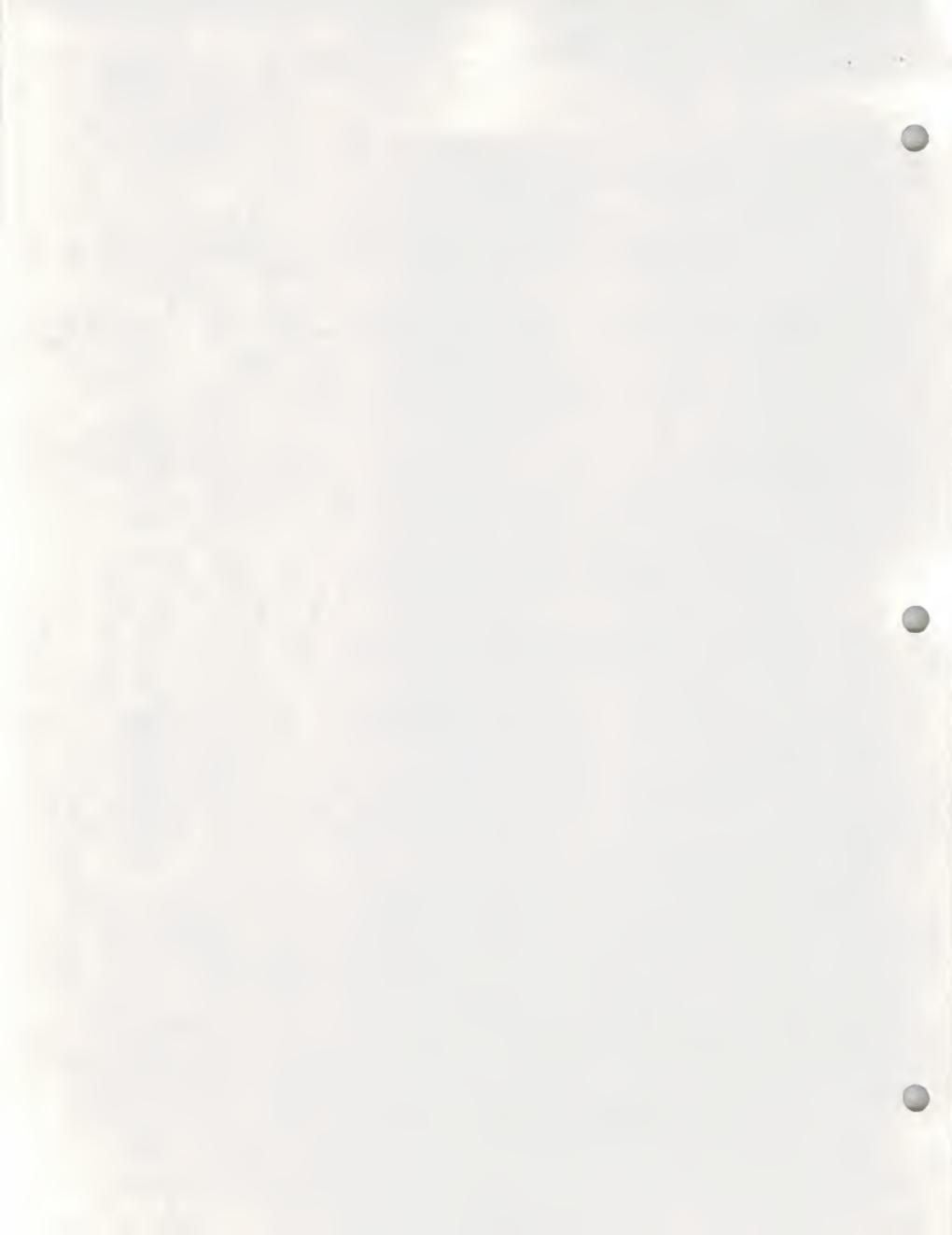
Water Analysis

PROJECT: ~~Kennedy/Conner~~

LAB NO.	90-33979	90-33980	90-33981
SAMPLE IDENTIFICATION	140103-27	140103-28	140101-624
SAMPLE SUBMITTED	12/12/90	12/12/90	12/12/90
DATE REPORTED	12/20/90	12/20/90	12/20/90
SAMPLE DATE	12/04/90	12/04/90	12/04/90
SAMPLE TIME	1220	1255	1340
CONSTITUENT	ug/l	ug/l	ug/l
Ethylbenzene	<1.0	<1.0	<1.0
m+p-Xylenes	<1.0	<1.0	<1.0
o-Xylenes	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
Bromobenzene	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0
2-Chlorotoluene	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	<1.0	<1.0	<1.0
4-Chlorotoluene	<1.0	<1.0	<1.0
tert-Butylbenzene	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	<1.0	<1.0	<1.0
sec-Butylbenzene	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<0.50	<0.50	<0.50
n-Butylbenzene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
1,2-Dibromo-3-Chloropropane	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	<1.0	<1.0	<1.0
Hexachlorobutadiene	<1.0	<1.0	<1.0
Naphthalene	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0	<1.0

REMARKS: Sample was properly preserved and in specified container. Sample was analyzed in accordance with EPA method 524.2.

Q.A. Review: Joe Stanek





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ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

WATER VOLATILE SURROGATE RECOVERY

PROJECT: Livingston/BN

SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #
90-35073	89	98	100

	QC LIMITS
S1 (TOL) = Toluene-d8	(80-120)
S2 (BFB) = Bromofluorobenzene	(80-120)
S3 (DCE) = 1,2-Dichloroethane-d4	(80-120)

Column to be used to flag recovery values with an asterisk

* Values outside of contract required QC limits



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ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

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JAN 15 1991

ENVIROCON, INC.
Livingston, MT

WATER VOLATILE SURROGATE RECOVERY

PROJECT: Livingston/BN

SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #
91-1695	100	85	110
91-1696	93	95	110
91-1697	99	103	95

	QC LIMITS
S1 (TOL) = Toluene-d8	80-120
S2 (BFB) = Bromofluorobenzene	80-120
S3 (DCE) = 1,2-Dichloroethane-d4	80-120

Column to be used to flag recovery values with an asterisk

* Values outside of contract required QC limits





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ENVIROCON
PO BOX 1154
LIVINGSTON MT 59047

WATER VOLATILE SURROGATE RECOVERY

PROJECT: Livingston/BN

SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #
90-35074	87	91	110
90-35075	99	94	99

	QC LIMITS
S1 (TOL) = Toluene-d8	80-120
S2 (BFB) = Bromofluorobenzene	80-120
S3 (DCE) = 1,2-Dichloroethane-d4	80-120

Column to be used to flag recovery values with an asterisk

* Values outside of contract required QC limits

Q.A. Review: for Shashi

